REMARKS/ARGUMENTS

Claims 1-14 and 19-21 are active. Claims 15-18 have been withdrawn from consideration. No amendments have been made, but a clean copy of the claims is provided for the convenience of the Examiner. No new matter has been added.

Rejection—35 U.S.C. §103(a)

Claims 1-3, 7, 19 and 21 were rejected under 35 U.S.C. §103(a) as being unpatentable over Speit, U.S. Patent No. 5,073,524, in view of Blackburn, U.S. Patent No. 5,221,646 and further in view of Loukes, et al., U.S. Patent No. 3,674,453. This rejection cannot be sustained for the following reasons.

Speit cannot teach or suggest the invention because it does not teach a float glass process as acknowledged by the Examiner in the 4th and 5th lines from the bottom of page 4 of the OA. Speit is irrelevant to the present process claims and should be removed as a reference because while it discloses radiation shielding windows containing 24-46% by weight of lead oxide, it is completely silent about any of the claimed method steps. The Speit process as described at the bottom of col. 8 does not involve the float glass method, but pouring a bubble-free melt into a mold. Thus, Speit is not pertinent to the presently claimed float glass process.

The Examiner agrees that Blackburn does not teach "that the floating occurs in a float plant with a neutral gaseous atmosphere", OA, p. 5, 2nd full paragraph.

The Examiner relies on Blackburn as teaching the limitation that the ribbon of glass contain at least 30% lead oxide. However, he has improperly construed col. 3, line 24 of Blackburn, which describes a composition containing "about 1 to about 25 weight percent PbO", as encompassing glass containing "at least 30% lead oxide" as requierd by claim 1. MPEP 2144.05(I) cited at p. 5, line 2 of the OA indicates that "where the claimed ranges

'overlap or lie inside ranges disclosed by the prior art' a *prima facie* case of obviousness exists". That is not the case here, because the prior art discloses a range of about 1 to about 25%, while the claims require "at least 30%". There is no overlap.

According to MPEP 2111 "During patent examination, the pending claims must be "given their broadest reasonable interpretation consistent with the specification." However, the broadest reasonable interpretation of "at least 30%" does not encompass "about 25%" because the limitation ***expressly*** requires "at least 30%" and Blackburn does not disclose or suggest a float glass process where the ribbon of glass contains "at least 30% lead oxide". The Examiner has cited no prior art and provided no technical reasoning why a glass ribbon containing about 1-25% lead oxide would have been considered the equivalent of a glass ribbon containing substantially more lead oxide. Therefore, Blackburn cannot be relied upon for teaching this element of the invention.

On page 5, lines 9-13, the Examiner concludes that it would have been obvious "to have applied the method for forming glass sheets comprising 1 to about 25 weight percent lead oxide disclosed in Blackburn to forming flat window panes comprising 24 to 46 percent by weight lead oxide, as disclosed by Speit". However, neither Blackburn nor Speit suggests that flat window panes comprising 24 to 46% lead oxide can be produced by the float glass method of Blackburn. The Examiner has not pointed out any suggestion in either reference for applying a float glass method to making glass containing at least 30% lead oxide or shown that these references would have provided a reasonable expectation of success for the process of the invention which solves fouling problems associated with prior art float glass processes as disclosed on pages 2-3 of the specification.

At the bottom of page 5 of the OA, the Examiner relies on Loukes for teaching:

> . . .a method for producing flat glass by a continuous float glass process (col. 2, lines 47-52), wherein the bath is a bath of molten tin or a molten

> tin alloy in which tin predominates and which has a specific gravity greater than that of the glass (col. 4, lines 61-64).

However, Loukes does not teach what is missing from the combination of Speit and Blackburn, namely it does not provide any suggestion for a float glass process where the glass contains ***at least 30% lead oxide***.

Loukes discloses both reducing and non-reducing atmospheres in col. 3, but does not teach that selection of a non-reducing atmosphere would solve the fouling problems associated with making a float glass containing at least 30% lead oxide.

No *prima facie* case has been established because there is no suggestion in the prior art to float glass containing at least 30% lead oxide on a bath of molten tin and no expectation that doing so under a neutral gas atmosphere would resolve the fouling problems associated with use of a reducing atmosphere as disclosed in the paragraph bridging pages 2-3 of the specification.

While the Examiner has not established a *prima facie* case for obviousness because he has not shown that the prior art suggests and provides a reasonable expectation of success for a float glass process where the ribbon of glass contains ***at least 30% lead oxide*** or for selecting a neutral atmosphere for such a process, further evidence of why one of ordinary skill in the art would not have had a reasonable expectation of success for such a process is found in U.S. Patent No. 4,015,966 (of record).

This patent concerns "Manufacture of X-ray absorbing glass composition by a float glass process", see Title. At col. 2, line 15 and in claim 1 it discloses compositions without lead (Pb) and explains that "the use of lead oxide (col. 1, line 32) in glass compositions implies the following problem: "While these X-rays absorbing glass compositions can be melted and formed by conventional techniques, a problem can sometimes arise in the form of

surface discoloration wherein such X-ray absorbing compositions are melted by a process where in the glass in the molten state is supported or floated on a bath of molten metal such as molten tin", col. 1, lines 58-64. To solve this problem the "molten glass is floated on a bath of molten tine, wherein said X-ray absorbing glass composition is free of the oxides of lead", col. 2, lines 13-15. Thus, this prior art teaches away from floating a glass rich in lead by suggesting that lead be omitted from the float composition.

Consequently, this rejection cannot be sustained because none of the prior art suggests a float glass process that floats a ribbon of glass containing at least 30% lead oxide, nor does it provide a reasonable expectation of success for such a process.

Rejection—35 U.S.C. §103(a)

Claim 4 was rejected under 35 U.S.C. §103(a) as being unpatentable over Speit, U.S. Patent No. 5,073,524, in view of Blackburn, U.S. Patent No. 5,221,646 and Loukes, U.S. Patent No. 3,674,453, as applied to claims 1-3, 7, 19 and 21 and further in view of Hiromatsu, et al., U.S. 2005/0028559 and further in view of Gardner, U.S. Patent No. 5,120,579. The three primary references have been addressed above. Hiromatsu and Gardner were relied upon for teaching the relative glass transition temperature points of lead-free and lead rich glass, but do not teach a float glass process where the ribbon of glass contains at least 30% lead oxide and where floating of the lead rich glass occurs under a neutral gaseous atmosphere. Hiromatsu is directed to a process using a reducing atmosphere—see paragraph [0004] and Gardner is directed to a process of firing a dielectric composition in "oxidizing atmospheres", see col. 1, lines 50-52. Thus, one with ordinary skill in the art would have found no guidance in these references for using a neutral atmosphere for producing a lead-rich glass. Therefore, this rejection cannot be sustained.

Rejection—35 U.S.C. §103(a)

Claim 8 was rejected under 35 U.S.C. §103(a) as being unpatentable over Speit, U.S. Patent No. 5,073,524, in view of Blackburn, U.S. Patent No. 5,221,646 and Loukes, U.S. Patent No. 3,674,453, as applied to claims 1-3, 7, 19 and 21 as evidenced by Shelby, *Lead Galliate Glasses*.

The three primary references have been considered above. Shelby does not disclose what is absent from the primary references, namely a float glass process where the ribbon of glass contains at least 30% lead oxide and where floating of the lead rich glass occurs under a neutral gaseous atmosphere. Moreover, while Shelby teaches a lead-rich glass containing 60 wt.% lead oxide, claim 8 is a process claim and Shelby and the other references do not suggest how to make a lead-rich glass containing at least 30% lead oxide according to the invention or how to solve the problem of formation of a grayish film the inevitably forms on the surface of lead-rich float glass, see the bottom of page 2 of the specification. Shelby was cited merely to show that the prior art recognized that glasses containing 60 wt.% lead oxide existed. The Examiner theorizes that one of ordinary skill in the art would have sought to simply use the method of Blackburn to make lead rich glass containing 60% by weight. As discussed above, Blackburn does not disclose or suggest any method for making glasses containing more than about 25 wt.% lead oxide, did not recognize the significant problems with use of the float glass process for lead glasses approaching the density of tin (*e.g.*, those containing at least 30% lead oxide) as disclosed on pages 1-2 of the specification, and thus could not have provided a reasonable expectation of success for the claimed process which resolves these problems.

Response to Examiner's Argument on pages 2-3 of the OA. In response to the Examiner first point, the density of lead rich glasses containing at least 30% lead oxide is

disclosed on page 3, line 29 to page 4, line 6 and the claims expressly require a ribbon of glass containing at least 30% lead oxide.

At the top of page 3 of the OA, the Examiner alleges that substituting a glass ribbon containing 60% lead oxide for Blackburn's glass that contains about 1 to about 25% lead oxide is a simple substitution of one known element for another. However, the Examiner points out no teaching, suggestion or motivation in the prior art for making such a substitution or for asserting the equivalence of glass ribbons containing different amounts of lead oxide. Those of ordinary skill in the art would have reasonably expected that lead oxide content would affect the properties of a glass ribbon in a float glass process due to the different chemical nature of the glass as well as the different density of glasses containing different amounts of lead oxide. The Examiner has not established any reason why one of ordinary skill in the art would have considered glasses containing significantly different amounts of lead oxide to be functional equivalents within a float glass process. Obviousness cannot be sustained with mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.' *In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006). That is lacking here because there is no explanation of why glass containing only 25% lead oxide would have been considered the equivalent within the float glass process of glass containing at least 60% lead oxide as required by claim 8.

Rejection—35 U.S.C. §103(a)

Claims 5, 9, 10 and 20 were rejected under 35 U.S.C. §103(a) as being unpatentable over Speit, U.S. Patent No. 5,073,524, in view of Blackburn, U.S. Patent No. 5,221,646 and further in view of Loukes, et al., U.S. Patent No. 3,674,453, and further in view of Brichard, U.S. Patent No. 3,801,412 and Direct Scientific, *LX-57B Lead Glass for Radiation Shielding*.

The three primary references have been addressed above. None of these teach a float glass process where the ribbon of glass contains at least 30% lead oxide and where floating of the lead rich glass occurs under a neutral gaseous atmosphere. Brichard and Direct Scientific also fail to disclose or suggest such a process.

Brichard was relied upon for teaching floating glass at a temperature ranging from 500-800°C and for maintaining a neutral and/protective atmosphere, col. 1, lines 14-21:

> **In the manufacture and/or conditioning of flat glass on a bath of molten material, it is known to maintain a generally neutral and/or protective atmosphere inside the tank. In this way active elements such as oxygen are prevented from entering into chemical reaction with the molten material to form compounds liable to form agents which would contaminate the glass or spoil the surface quality of the sheet or ribbon.**

Brichard does not teach float glass containing at last 30 wt.% lead oxide nor did he recognize the advantages of using a neutral gaseous atmosphere instead of one containing a reductive gas, like hydrogen--see col. 11, lines 24-30 which describe a protective gas mixture containing nitrogen and 5% hydrogen.

> **Before the tank 14 is filled with molten metal, it is flushed through with a protective gas, e.g. a gas mixture consisting 95 percent by weight of nitrogen and 5 percent by weight of hydrogen. When the tank is filled with the protective gas and all of the air has been expelled, molten metal is introduced into the tank, or a charge of metal already present in the tank is melted. The tank is then thermally conditioned by thermal conditioning means (not shown) such as electrical resistance heaters.**

Brichard cannot provide a reasonable expectation of success for the invention which avoids the grayish film (of metallic lead) that inevitably forms when a reductive atmosphere is used with a lead rich glass, see the paragraph bridging pages 2-3 of the specification because it expressly teaches use of a reductive atmosphere, such as the one described above containing 5% hydrogen. Moreover, Brichard is not directed to production of lead-rich glass,

does not recognize the problems associated with the production of lead-rich glass such as those disclosed at the bottom of page 2 of the specification, and cannot provide a reasonable expectation of success for the claimed process which solved these problems.

Direct Scientific was relied upon for teaching "a lead oxide glass comprising at least 55 percent lead oxide", but fails to disclose or suggest limitations missing from the primary references or from Brichard. That is while Brichard teaches lead-rich glass containing 55% lead oxide, it does not disclose or suggest a process for making lead-rich glass that solves the problems described at the bottom of page 2 of the specification. Therefore, this rejection cannot be sustained.

Rejection—35 U.S.C. §103(a)

Claims 6 and 11 were rejected under 35 U.S.C. §103(a) as being unpatentable over Speit, U.S. Patent No. 5,073,524, in view of Blackburn, U.S. Patent No. 5,221,646 and further in view of Loukes, et al., U.S. Patent No. 3,674,453, as applied to claims 1-3, 7, 19 and 21, and further in view of Jeanvoine, et al., U.S. 2002/0162358.

The three primary references have been addressed above. Jeanvoine was relied upon for teaching a molten metal treatment station and the use of a submerged burner for melting glass. However, Jeanvoine does not disclose or suggest what is absent from the primary references. Therefore, this rejection cannot be sustained.

Rejection—35 U.S.C. §103(a)

Claims 12-14 were rejected under 35 U.S.C. §103(a) as being unpatentable over Speit, U.S. Patent No. 5,073,524, in view of Blackburn, U.S. Patent No. 5,221,646 and further in view of Loukes, et al., U.S. Patent No. 3,674,453, and further in view of Jeanvoine, et al.,

U.S. 2002/0162358 as applied to claim 11; and further in view of Maugendre, WO03/045859 (equiv. to U.S. 7,428,827).

The four primary references have been addressed above. Maugendre was relied upon for teaching a float plant which includes a furnace with *two components*. However, Maugendre cannot remedy the deficiencies of the primary references, and furthermore, fails to teach "the second tank being fed with lead oxide" as required by claims 12-14 (see OA, line 3 from bottom of page 10). Therefore, the references in combination do not teach all the limitations of the rejected claims and this rejection cannot be sustained.

Request for Rejoinder

Claims 15-18, to any extent considered to lack unity, should be rejoined and allowed with examined method claim 1 from which they now all depend. These claims were deemed to lack unity on the ground that the special technical feature "comprising at least 30% lead oxide by weight" lacked novelty. However, these method claims have been amended to depend from claim 1 and thus intrinsically share its general inventive concept and unique special technical features, see MPEP 1893.01(d).

Conclusion

This application presents allowable subject matter and the Examiner is respectfully requested to pass it to issue. The Examiner is kindly invited to contact the undersigned should a further discussion of the issues or claims be helpful.

Respectfully submitted,

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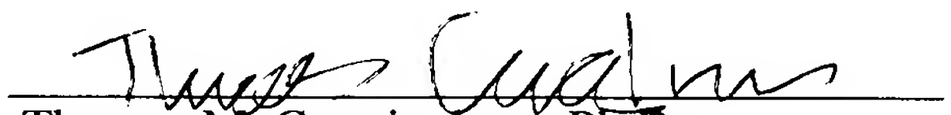

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